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THE HAZARDOUS WASTE PROBLEM AND ITS MANAGEMENT

Department of Environmental Quality Engineering  
Division of Hazardous Waste

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## PREFACE

Massachusetts, like the rest of the nation, is faced with a serious hazardous waste problem. Corrosive, ignitable, explosive and toxic waste have been disposed of carelessly for over a century, ending up in our fields, rivers, woodlands and drinking water. In recent years, 29 Massachusetts communities have lost portions of their public water supplies because of contamination from nearby illegal hazardous waste dumps.

Approximately 350,000 tons of hazardous waste are generated in Massachusetts each year. This is five percent of the estimated 7.5 million ton total of industrial, commercial, and residential solid waste generated annually in the Commonwealth. Hazardous waste is created by a variety of sources including industry, the military, schools, hospitals, and research laboratories. The manufacture of most items found in our homes and workplaces produces some hazardous waste by-products when improperly handled, these by-products can work its way into the environment, threatening public health and damaging local ecology.

While public awareness of these problems has been growing, government has been developing programs and regulations to ensure that hazardous waste will be handled safely in the future. Massachusetts began regulating hazardous waste in 1973, well before many other states or the federal government. However, these laws and regulations were not specific and detailed enough to prevent problems from occurring.

In 1976, the United States Congress enacted the Resource Conservation and Recovery Act (RCRA) to "promote the protection of health and the environment and to conserve valuable resources" by significantly changing the ways in which solid and hazardous wastes are handled. RCRA requires the United States Environmental Protection Agency (EPA) to regulate hazardous waste from "cradle to grave" by developing a list of specific standards that must be met by those who produce, handle, transport, store, treat and dispose of hazardous wastes. EPA's regulations, which went into effect November 19, 1980, establish a minimum nationwide framework for hazardous waste management. States may build upon and expand these requirements to suit their individual needs.

RCRA encourages states to take over the hazardous waste management program if they develop regulations and programs minimally equivalent to and consistent with those of EPA. States must apply to EPA to have their programs approved. The Massachusetts Department of Environmental Quality Engineering's Division of Hazardous Waste applied for and was granted Phase I interim authorization from EPA on February 25, 1981. The Commonwealth now has two years to come into full compliance with the RCRA program. At any point during that time, the Division may apply for final authorization.

In November 1979, the Massachusetts legislature enacted the Hazardous Waste Management Act (Chapter 21C of the General Laws), which made the Commonwealth's waste management program consistent with RCRA's. The Act requires the Department of Environmental Quality Engineering (DEQE) to establish a Division of Hazardous Waste to develop more comprehensive hazardous waste regulations and a strong licensing and enforcement program. It requires the Department to license collectors, haulers, processors, and disposers of hazardous waste, as well as to regulate hazardous wastes

at the site of generation. In addition, all of these parties must comply with a "manifest" recordkeeping system which tracks the movement of wastes from their point of generation, through each step in their transportation, to their ultimate destination in an approved treatment, storage, or disposal facility. To further insure safe management of hazardous waste in the Commonwealth, the Act requires the Department to involve interested and affected persons in all aspects of the program.



## THE HAZARDOUS WASTE PROBLEM AND ITS MANAGEMENT

### A. Overview of the Hazardous Waste Problem

According to the 1979 Massachusetts Hazardous Waste Management Act (Chapter 21C of the General Laws), hazardous waste is "a waste, or combination of wastes, which because of its quantity, concentration, or physical, chemical or infectious characteristics may cause, or significantly contribute to an increase in mortality or an increase in serious...illness or pose a substantial present or potential hazard to human health, safety, or welfare or to the environment when improperly treated, stored, transported, used, or disposed...." The Department's comprehensive hazardous waste regulations which will go into effect in early 1982, expand upon this definition and identify what types of waste are hazardous.

#### 1. Hazardous Waste Generators and the Types of Waste Produced

Hazardous wastes are created by a variety of sources including industry, the military, schools, hospitals, and research laboratories. Of these, industry is the largest generator.

Most industrial and manufacturing processes generate some hazardous waste. Seventeen (17) industries are expected to be most affected by hazardous waste regulations because the type of hazardous wastes they produce are expensive to treat or dispose of and/or because they generate large volumes of hazardous wastes: electronics; electroplating; plastics; metal finishing; special machinery manufacturing; inorganic chemicals; textiles; metals smelting and refining; leather tanning and finishing; pesticides; rubber; pharmaceuticals; paint and allied products; batteries; explosives; and petroleum refining and rerefining. #1

A recent study<sup>2</sup> has estimated that between 230 and 330 million gallons of hazardous waste are generated per year in New England. That is an average of 25 gallons per person per year. The estimated volumes of waste generated in Massachusetts<sup>3</sup> which DEQE judges to be low, are shown below:

<u>Waste</u>	<u>Million gallons per year</u>
automotive oil	14
industrial oil	12
solvents	8
acid/alkali	6
sludges	19-55 *
chemicals	3
other (includes PCBs, reactive materials, asbestos, plastics, resins and other wastes)	1
<hr/>	
63-99 million gallons per year	

\* The low figure, 19 million gallons, is the amount of sludge currently generated each year in Massachusetts. The high figure, 55 million gallons, assumes that Massachusetts will produce substantially more sludge after the pretreatment program for industrial wastes is fully established. For more information see p.B.-9 of "A Plan for Development of Hazardous Waste Management Facilities in the New England Region" prepared by Arthur D. Little, Inc., September 1979.

The Minnesota Waste Management Board prepared the following summary of the types of wastes generated during the production of consumer goods.<sup>4</sup>

<u>THE PRODUCTS WE USE</u>	<u>COMPONENT</u>	<u>TYPICAL WASTE</u>	<u>TYPE OF HAZARD</u>
<u>Electrical Products</u>	printed circuit boards	cyanides	toxic
- televisions		metal sludges	toxic
- micro-wave ovens		caustics	corrosive
- radios		(chromic acid)	
- stereos			
- toasters	wire	acids	corrosive
- blenders		solvents	flammable & toxic
- typewriters		oil	toxic
<u>Textile-Mill Products:</u>			
- all clothing	dyes	waste organic compounds	toxic
		waste water treatment sludge	toxic
- leather		chromium shavings	toxic
- synthetics	material	solvents	flammable & toxic
		waste organic compounds	toxic
		metals (catalysts)	toxic
<u>Paper and Allied Products</u>			
- newspapers	paper	waste water treatment sludges	toxic
- magazines		organic by-products	toxic
- books		black liquor	corrosive
- pamphlets	ink	solvents	flammable & toxic
- brochures		waste ink	toxic
		oils	toxic
<u>Lumber, Wood Products, Wood Treating</u>		chromium	toxic
		lead	toxic
- wood furnitures		creosote	toxic
- fencing		oils	toxic
		caustics	corrosive
		sediment sludge	toxic
		pigments	toxic

<u>THE PRODUCTS WE USE</u>	<u>COMPONENT</u>	<u>TYPICAL WASTE</u>	<u>TYPE OF HAZARD</u>
<u>Automobiles, Trucks, Tractors</u>			
	trim, bumpers	acids	corrosive
	engine	metal sludges	toxic
		heat treating wastes	toxic &
		(oils, salt solutions)	reactive
	body	paint sludges	toxic
		solvents	flammable
			& toxic
<u>Petroleum Products</u>			
- gasoline		waste petroleum	toxic
		by-products	
- oil		acid sludges	corrosive
- diesel fuel			& toxic
- asphalt			
<u>Agricultural Chemicals</u>			
- pesticides		solvents	flammable
			& toxic
- herbicides		waste organic compounds	toxic
- insecticides		sludges	toxic
<u>Instruments, Related Products</u>			
- computers		ferric chloride	corrosive
- digital watches & clocks		acids	corrosive
- medical diagnostic equipment		xylene	flammable
			& toxic
		methylene chloride	toxic
		alcohols	flammable
		acetone	flammable
		cadmium	toxic
		nickel	toxic
		zinc	toxic
<u>Stone, Clay, Glass Products</u>			
- pottery		solvents	flammable
- knick-knacks			& toxic
- mirrors		oil & grease	toxic



<u>THE PRODUCTS WE USE</u>	<u>TYPICAL WASTE</u>	<u>TYPE OF HAZARD</u>
<u>Furniture and Fixtures</u>		
- lamps	metals	toxic
- chrome furniture	acids	corrosive
- brass furniture	solvents	flammable & toxic
<u>Food Industries</u>		
- bottled beverages	lime sludge	corrosive
- prepared household foods	hexane solvent	flammable
- vegetable oil extraction	used laboratory oils	toxic
- beet sugar extraction		
<u>Medicines</u>		
	organic solvents and residues	flammable & toxic
	heavy metals (mercury, zinc, etc.)	toxic
<u>Plastic Products</u>	organic chlorine compounds	
<u>Mining</u>		
- utilization of heavy machinery	solvents (mineral spirits)	flammable & toxic
- ore extraction process	paint sludge	toxic
	petroleum products	toxic
	alkaline sludge	corrosive
	mercury	toxic
<u>Primary Metal Industries</u>		
- foundries	oils	toxic
- pipe	waste water treatment sludge	toxic
- wire	leach residue (chromium, lead, arsenic)	toxic
	coking operation sludge	toxic
	solvents (alcohols, acetone, trichloroethylene)	flammable & toxic
	paint wastes (benzene, lead, nickel, chromium)	toxic
	caustics	corrosive



<u>THE PRODUCTS WE USE</u>	<u>TYPICAL WASTE</u>	<u>TYPE OF HAZARD</u>
<u>Public Utilities &amp; Services</u>		
- phone, electric power, gas	oil solvents	toxic flammable & toxic
	PCBs	toxic
	gas/water sludge	toxic
	oil/water sludge	toxic
	acid solution	corrosive
	metal plating (chromium, nickel, cadmium)	toxic
<u>Universities, Colleges, Laboratories</u>		
- laboratory wastes	formaldehyde	flammable & toxic
- power plant wastes	alcohols	flammable
	acetone	flammable
	paint residues contain- ing heavy metals	toxic
	petroleum products	toxic

## 2. Hazardous Waste Treatment/Disposal in Massachusetts

Massachusetts does not have enough treatment, storage, and disposal facilities to properly dispose of all the hazardous waste produced here. There are fifteen facilities licensed to treat and dispose of certain wastes in Massachusetts. These facilities can handle only a small percentage of the wastes generated in the Commonwealth. The processes being used at the facilities include the reclamation of certain solvents, the incineration of some organic wastes, and the neutralization of acids and alkalis.

By comparing the hazardous wastes generated with the present capacity for treatment and disposal in state, the Department of Environmental Management has estimated that the following additional capacity requirements<sup>5</sup>:

- approximately 10,000 tons/year of flammable solvents must be reclaimed;
- up to 40,000 tons/year of aqueous wastes must be treated;
- an additional capacity of about 25,000 tons/year is needed for liquid incineration;
- rotary kiln capacity of 25,000-50,000 tons/year is needed; and
- at least one secure landfill is required.

These figures are based on the best available estimates of the amount of hazardous waste generated and processed in the Commonwealth. In the near future, information from the regional manifest system, the Metropolitan District Commission pretreatment program, monthly reports filed by transporters, and annual reports filed by generators and treatment/disposal facilities should improve our data base.

In addition to the known shortfall of treatment/disposal capacity for hazardous wastes produced in the Commonwealth, there is an unknown quantity of hazardous waste which is dumped in Massachusetts by illegal interstate operations.

### 3. Hazardous Waste Contamination of Our Environment

When improperly handled, hazardous wastes can contaminate our lakes, rivers, air, soils, and ground water. Hazardous waste can pollute surface waters (lakes, rivers, streams, ponds) through direct dumping, or as run-off from stockpiled wastes, landfills, and open dumps. They may contaminate the air through open burning, wind erosion, or directly changing from a liquid to a gas. Our soils may be contaminated by direct dumping, by leaking containers at old abandoned hazardous waste dumps, or by improperly managed disposal sites.

Perhaps the most critical problem caused by mismanaged hazardous wastes is the contamination of groundwater - water that exists beneath the surface of the ground, as distinguished from surface lakes and streams - since ground water is a major source of drinking water supplies in Massachusetts. Hazardous wastes can seep into the ground water from dump sites, poorly located or designed landfills, or improperly managed treatment, storage, and disposal lagoons, and then migrate for many miles and contaminate drinking water supplies.

Ground water collects in formations called aquifers (a layer of rock, sand, or gravel holding significant quantities of subsurface water) and flows at variable rates in identifiable patterns. Unlike rivers and streams, ground water flows extremely slowly-from a few feet per day to a few feet per decade. It may move vertically as well as horizontally. Gravity, hydraulic pressure from other wells, and the composition of the subsurface rock/soil have a great effect on its movement. Depending on the soil composition of the area, ground water may be found from a few feet to several hundred feet below the surface.

Surface water and ground water are interconnected. Ground water generally discharges to rivers, streams and lakes; and conversely, surface water can infiltrate ground water under certain conditions. This relationship between surface and ground water means that the contamination of one source may contaminate the other.

Ground water contamination can result when contaminants leach (seep) into the ground in areas when there are no natural impermeable soil layers to prevent this kind of migration. For example, industrial wastes, dumped in an unlined lagoon located on top of sandy soil, would leach readily into the ground water below. However, the same wastes, when placed in an unlined lagoon with a layer of thick clay below it, would not leach as easily into the ground water.

### 4. The Impact of Hazardous Waste on Public Health

The impact of improper disposal activities on public health is extremely difficult to estimate. Once hazardous contaminants have been released into the environment, people may be exposed to them in many different ways including:

- Breathing noxious and/or poisonous fumes and polluted air;
- Drinking contaminated water;



- Touching explosive, corrosive, or toxic material; and
- Eating contaminants on foods, that were accidentally exposed to hazardous chemicals through the uptake of the chemicals from the soil or through the deposition of airborne chemicals.

Many hazardous contaminants have long latency periods, that is, symptoms may not become apparent for many years after exposure. The effects of long term exposure to relatively low doses of contaminants are not well documentd. For example, no one can predict what health effects may result from small quantities of illegally dumped hazardous waste leaching into a community water supply. Little is know about synergistic effects, or the effects on human health from exposure to a number of different types of substances at the same time. Some substances become more potent in combination while others become weaker.

Because of the wide range of potentially toxic substances to which human beings are exposed daily, it is difficult to determine with certainty "cause and effect" relationships between toxics and human health effects. There is little or no scientific information on the human health effects of chemicals found in the environment. When information does exist, it often comes from occupational studies or from accidental poisoning data in which exposure levels are much higher than those occurring in the environment. Of special concern is the lack of information on the very young and old who may be more sensitive to the effects of environmental contaminants. Since for ethical reasons we cannot test human subjects to obtain information on the health effects of chemicals, we must rely on data from animal studies. Because the concern to protect the public from adverse health effects is so high, it is necessary to test animals at high doses so that the information can be gathered much more quickly. While this information is useful, there truly exists a gap in our knowledge of the human health effects from low level exposure to environmental pollutants.

## B. The Control of Hazardous Waste

Proper hazardous management in Massachusetts will depend on several important programs:

1. developing comprehensive regulations to carefully track and stringently control hazardous wastes from their point of generation through each stage in handling, processing and final disposal, in order to safeguard public health and the environment;
2. conducting an effective surveillance and enforcement program to ensure that the regulations are being followed;
3. developing a network of environmentally sound, tightly controlled treatment, storage, and disposal facilities to provide an acceptable alternative to illegal dumping; and
4. assessing and resolving the problems posed by improper hazardous waste disposal activities, both abandoned and on-going practices.

The success of each element largely depends on the effectiveness of the others. For example, even the best regulations will have little impact unless they are backed up by an effective enforcement program. Likewise, strong regulations and a tough



enforcement program may result in even more illegal dumping unless badly needed, tightly controlled treatment, storage, and disposal facilities can be located in the state. Finally, the legacy of more than a century of improper waste disposal must be understood and addressed before the Commonwealth's hazardous waste problem can be completely resolved.

The Department of Environmental Quality Engineering is responsible for three of these four programs: developing the comprehensive regulations; enforcing the regulations; and assessing the problems posed by past improper hazardous waste activities. The development of environmentally sound, licensed treatment, storage, and disposal facilities is the responsibility of the Department of Environmental Management and the Site Safety Council.

## 1. Comprehensive Regulations

The Massachusetts Hazardous Waste Management Act requires the DEQE Division of Hazardous Waste to develop a comprehensive regulatory system for hazardous waste. Some of the specific requirements of the Act include that:

- no person will be allowed to collect, transport, store, treat, use or dispose of hazardous waste unless that person is in possession of a valid license and a manifest;
- DEQE must require licensees to obtain and maintain a contract of liability insurance, a surety bond, or other evidence of financial responsibility sufficient to assume the costs of damages resulting from accident or negligence, and to provide for the long-term care of licensed facilities after they reach capacity; and
- improper hazardous waste disposal is punishable by a fine of up to \$25,000 per violation per day, and/or up to five year's imprisonment. This means that offenses will be a felony.

The Division expects to finalize its regulatory program except for the specific standards for treatment, storage, and disposal facilities, by January 1982. Until that time, the Massachusetts Hazardous Waste Regulations (315 CMR 2.00) which have been used since 1973 will remain in effect. These regulations require that all generators must continue to send their wastes to approved facilities, either in state or out of state. Hazardous waste licensees are required to submit monthly reports to DHW detailing the volume and types of wastes handled, and where the wastes are taken. In addition, DEQE on October 27, 1980 adopted the federal Resource Conservation and Recovery Act (RCRA) hazardous waste regulations which apply to generators, transporters, and treatment, storage, or disposal facilities (40 CFR Parts 260-265).

The Division developed an extensive public participation process to involve the regulated community and all potentially affected parties in the writing of the new regulations. First a Discussion Draft of the regulations was produced and distributed to every public library in the state. The Draft outlined the issues involved in each part of the regulations. A short newspaper style summary of the Discussion Draft was written and distributed to over 5,000 individuals in the Commonwealth. After a period of public review of these materials, the Division held 14 public meetings to present the draft regulations and to generate public discussion and comment. More than 450 people attended these meetings. Their comments were summarized and responded to in an issue of the Division's newsletter, the Hazardous Waste Update. Many of the



comments significantly changed the content and structure of the regulations and were incorporated into the Public Hearing Draft of the regulations. Seven hearings will be conducted for the proposed regulations and statements from the public will be formally received. The Division believes that using this public process will make the regulations a working system since all the affected parties have had input into the decisions made during the writing of the regulations.

## 2. An Effective Surveillance and Enforcement Program

The Hazardous Waste Management Act expands state enforcement authority and imposes penalties of up to \$25,000 per offense per day, and/or up to five years imprisonment for violation of hazardous waste regulations. This means that illegal disposal is a felony. These provisions, along with the other specific requirements of the Act, have resulted in more aggressive enforcement actions by both the Attorney General and DEQE. In the last two years major criminal prosecutions involving 12 persons and corporations were initiated, resulting in 9 persons being sentenced to jail terms. Thirty-five civil actions also have been initiated against a number of those who dump and mishandle hazardous waste; of these actions, ten cases have been settled resulting in court orders, civil penalties, and payments for damages. The Department has issued several major administrative orders to firms including the General Electric Co. in Pittsfield and Roche Brothers Barrel Co. in Lowell. An administrative order is a method used by the Department to bring about compliance.

The Department and the Attorney General's office have joined forces in several areas to combat "midnight dumping." These include:

- establishing a hazardous waste strike force to review potential criminal enforcement cases and coordinate state investigations of those cases;
- holding training sessions for law officers, lawyers, and DEQE's technical personnel to increase their effectiveness in investigating criminal waste handling activities and ensuring that wastes are properly handled during the police raids;
- working closely with other state Attorneys General and environmental officials to investigate suspected interstate waste dumping operations; and
- increasing surveillance of suspected illegal "gypsy" haulers and impounding suspected hazardous waste cargoes.

To expand its own program to prevent "midnight dumping" and to ensure that the Department responds to hazardous waste problems effectively, the Department has appointed four regional hazardous waste coordinators. Over the past year, the Department also has tightened its procedures for licensing firms that transport, store, treat, or dispose of hazardous waste in Massachusetts. DHW required existing licensees to submit a detailed summary of their technical, analytical, and financial qualifications; the same information is also required of all new applicants. Based on these tougher new licensing standards, DHW has notified 44 hazardous waste firms of its intent to deny their applications for licenses to handle hazardous wastes in the Commonwealth. Twenty-seven licenses have been revoked, and 132 licenses have been issued.



### 3. Hazardous Waste Treatment, Storage, and Disposal Facilities

Massachusetts must develop a network of properly sited and controlled facilities to store, treat, and dispose of hazardous wastes in an environmentally sound manner. The lack of facilities is a severe problem which affects business, the environment, and public health. Because of this, developing a network of facilities is a high priority for the Executive Office of Environmental Affairs.

The lack of facilities is becoming increasingly critical. Not only is the cost of out of state disposal rising dramatically, but the few environmentally adequate hazardous waste disposal facilities in the country are experiencing tremendous demands for their services and are quickly reaching capacity. Massachusetts firms are constantly threatened with the prospect of shipping wastes even greater distances as nearer facilities refuse to accept their wastes.

Industry will continue to face escalating costs for proper waste disposal if facilities do not become available. Disposal costs at out of state disposal facilities have been increasing at an approximate rate of 65 percent per year during the last two years. Transportation costs have also risen sharply. For example a local business which last year spent 400 dollars per truckload to send its waste to an out of state facility is now paying 4000 dollars.

Strong regulations and a tough enforcement program may result in even more illegal dumping unless badly needed, tightly controlled facilities can be located in the Commonwealth and throughout New England.

To address this problem, the Legislature enacted the Massachusetts Hazardous Waste Facility Siting Act (Chapter 508 of the Acts of 1980) based on the report of the Special Legislative Commission on Hazardous Waste Facility Siting. The law emphasizes community involvement in decision making and stresses the protection of public health and the environment in the construction and operation of facilities. The process for facility siting emphasizes negotiation between the potential developer and the host community. The Department of Environmental Management (DEM) and the Site Safety Council are responsible for implementing the Act.

### 4. Improper Hazardous Waste Disposal Activities

The regulatory and enforcement programs described above are aimed at stopping illegal disposal practices today and in the future. This involves stopping violations of the present hazardous regulations and bringing illegally disposed of hazardous waste under proper control.

In addition to the problems posed by current improper practices, there are substantial problems created by more than a century of improper waste disposal. Many communities are learning today about the presence of old deposits of hazardous wastes within their own boundaries. The trouble may be discovered at an old disposal pit, in abandoned barrels, or through contaminated drinking water.

It is possible to safely treat and properly dispose of hazardous wastes, which have been abandoned or dumped on the land; but the process is extremely time-consuming and expensive. The state has already spent nearly 2.7 million dollars of our tax money to clean one site alone - Silresim, in Lowell, where 21,000 barrels were abandoned at a five acre chemical reclamation facility. Additional funds have been spent in the small southeastern towns of Dartmouth and Freetown. At these sites



hazardous wastes were dumped onto the ground, and illegally stored in warehouses in 55 gallon drums. To date, \$509,000 has been spent on the clean-up of these sites.

Sites like these can be cleaned by removing all barrels and securing the area to prevent further dispersal of the waste. The contaminated soil from the site may be treated, contained on site, or trucked to a secure disposal facility out-of-state. Contaminated groundwater may be treated, although the complete removal of the chemicals is frequently not possible. Containment of the wastes and contaminated soils on location may be the best option for some sites. Making the decision about which of these options are most appropriate for a given site is difficult and must be a public process. Unless the potentially affected parties and the community understand the options and help decide on a particular solution, the problems associated with the site cannot be resolved.

Securing and/or cleaning up uncontrolled hazardous waste sites created by more than a century of improper disposal practices is only part of the solution. We must also ensure that our legacy to future generations does not include additional uncontrolled hazardous waste dump sites. But without strong regulations, tough enforcement, and the development of licensed treatment, storage, and disposal facilities, the incentive for improper hazardous waste disposal will continue to escalate.

For more information, write or call the:

Public Information Office, DEQE  
One Winter Street, 10th floor  
Boston, MA 02108  
(617) 292-5515

Division of Hazardous Waste, DEQE  
One Winter Street, 8th floor  
Boston, MA 02108  
(617) 292-5630

For information on siting and development of hazardous waste treatment, storage, and disposal facilities, as discussed in part II section 3 of this report, write or call the:

Executive Office of Environmental Affairs  
100 Cambridge Street, 20th floor  
Boston, MA 02202  
(617) 727-9800

Bureau of Solid Waste Disposal  
Department of Environmental Management  
100 Cambridge Street, 19th floor  
Boston, MA 02202  
(617) 727-4293

- <sup>1</sup> Robert B. Pojasek, "Disposing of Hazardous Chemical Wastes," Environmental Science and Technology, July 1979, Vol. 13, p. 810.
- <sup>2</sup> "A Plan for Development of Hazardous Waste Management Facilities in the New England Region," prepared by Arthur D. Little, Inc., September 1979, p. B-11/B-12.
- <sup>3</sup> I bid, p. B-11/B-12.
- <sup>4</sup> Minnesota Waste Management Board, March 26, 1981.
- <sup>5</sup> "Statewide Environmental Impact Report," prepared by the Department of Environmental Management, May 1981, p. 5-1.